Journal of Applied Toxicology

2005 **Volume 25**

JJATDK 25(1–6) 1–580 (2005)
ISSN 0260–437X

WILEY
Publishers Since 1807
Chichester · New York · Weinheim · Brisbane · Singapore · Toronto

Journal of Applied Toxicology

(J Appl Toxicol) AN INTERNATIONAL JOURNAL

EDITOR-IN-CHIEF
Harry Salem

Edgewood Chemical & Biological Center
AMSSB-RRT, Building E3330/143
Aberdeen Proving Ground
MD 21010-5424, USA
Tel: +1 410 436 3034
Fax: +1 410 436 3930
E-mail: harry.salem@us.army.mil

EUROPEAN EDITOR
Philip W. Harvey

Covance Laboratories UK Ltd, Toxicology
Otley Road, Harrogate
North Yorkshire
HG3 1PY, UK
Tel: +44 (1423) 848421
Fax: +44 (1423) 569595
E-mail: philip.harvey@covance.com

EDITOR, JAPAN
Professor Tohru Inoue

Director, Center for Biological Safety & Research,
National Institute of Health Sciences
1-18-1 Kamiyoga
Setagayaku
Tokyo 158-8501, Japan
E-mail: tohru@nihs.go.jp

ACCEPTING EDITOR, USA
Professor Saura Sahu

Division of Toxicology
Office of Applied Research and Safety Assessment
Center for Food Safety and Applied Nutrition
U.S. Food and Drug Administration
8301 Muirkirk Road, Laurel
MD 20708, USA
E-mail: saura.sahu@cfsan.fda.gov

EMERGING ISSUES EDITOR
James J. McGrath

6601 Huntingridge Road
Chapel Hill, NC 27514, USA
E-mail: drjim@mindspring.com

REVIEWS EDITOR
Kannan Krishnan

Dep. Santé Environmental/Santé au Travail, Université de Montréal
2375 Cote Ste. Catherine
Bureau 4105
Montreal QC H3T 1A8, Canada
E-mail: kannan.krishnan@umontreal.ca

TOXICOLOGY UPDATES EDITOR
Alan C. Katz

ToXcel
Toxicology & Regulatory Affairs
7545 Presidential Lane, Manassas
VA 20109, USA
E-mail: alan@toxcel.com

FOUNDING EDITOR
Michael Greenwood

ASSISTANT EDITOR
Teresa Rudd

EDITORIAL ADVISORY BOARD

J. Ashby
Syngenta Central Toxicology Laboratory, Macclesfield, Cheshire, UK
P. Baldrick
Covance Laboratories Ltd., Harrogate, UK
B. Ballantyne
Union Carbide Corporation, Danbury, CT, USA
S. I. Baskin
US Army Medical Research Institute of Chemical Defense, MD, USA
J. R. Beall
US Department of Energy, Washington, DC, USA
D. Benford
Food Standards Agency, London, UK
J. F. Borzelleca
Medical College of Virginia, Richmond, VA, USA
W. J. Brock
Unilever Research-US, Edgewater, NJ, USA
N. Chernoff
US Environmental Protection Agency, NC, USA
J. Descotes
Lyon Poison Centre, Lyon, France
S. W. Ernst
AstraZeneca R&D, Mölndal, Sweden
D. J. Everett
Covance Laboratories Ltd., Harrogate, UK
V. Eybl
Charles University Faculty of Medicine, Pilsen, Czech Republic
S. C. Gad
Gad Consulting Services, Cary, NC, USA
P. Goldfarb
University of Surrey, Guildford, UK
S. Green
Howard University, Washington, DC, USA
S. Halbach
GSF Research Centre, Neuherberg, Germany
G. Healing
AstraZeneca, Alderley Park, Macclesfield, UK
R. Kapp, Jr
BioTox, Richmond, VA, USA
S. A. Katz
Rutgers University, Camden, NJ, USA
F. Koschier
Pfizer Inc., Morris Plains, NJ, USA
K. Kostial
Institute for Medical Research & Occupational Health, Zagreb, Croatia
D. Lison
Catholic University of Louvain, Belgium
E. A. Lock
Medical University of South Carolina, Charleston, SC, USA
H. Maibach
University of California Medical School, San Francisco, CA, USA
M. McFarlane
GlaxoSmithKline, Ware, UK
N. A. Monteiro-Riviere
North Carolina State University, Raleigh, NC, USA
R. A. Parent
Consultox Ltd, Damariscotta, ME, USA
G. Reddy
US Army Center for Health Promotion and Preventive Medicine, Edgewood, Maryland, USA
S. C. Sahu
USFDA Division of Toxicological Research, Laurel, MD, USA
H. Satoh
Tohoku University Graduate School of Medicine, Sendai, Japan
K. Savolainen
Finnish Institute of Occupational Health, Helsinki, Finland
V. M. Seabaugh
Falls Church, VA, USA
D. E. Sharp
Boehringer-Ingelheim Pharmaceuticals, Inc., Ridgefield, CT, USA
A. G. Smith
MRC Toxicology Unit, University of Leicester, UK
R. Snyder
EOHSI Busch Campus, Piscataway, NJ, USA
H. Soreq
The Hebrew University of Jerusalem, Israel
R. G. Tardiff
The Sapphire Group Inc., Bethesda, MD, USA
R. Valentine
E. I. du Pont de Nemours & Co., Newark, DE, USA
E. K. Weisburger
Rockville, MD, USA
C. Winder
University of New South Wales, Sydney, Australia
C. Winek
Duquesne University, Pittsburgh, PA, USA

JOURNAL OF APPLIED TOXICOLOGY
J. Appl. Toxicol, **25**, iii–vi (2005)

Contents of Volume 25

NUMBER 1 JANUARY/FEBRUARY 2005

Review

Chemistry and toxicology of building timbers pressure-treated with chromated copper arsenate: a review 1
S. A. KATZ AND H. SALEM

Research Articles

Protection of endotoxin-induced oxidative renal tissue damage of rats by vitamin E or/and EGb 761 treatment 8
O. COSKUN, F. ARMUTCU, M. KANTER AND G. M. KUZEY

Segmentary effects on the renal proximal tubule due to hexachloro-1,3-butadiene in rats: biomarkers related to gender 13
A. TREVISAN, P. CRISTOFORI, M. BEGGIO, M. B. VENTURINI, L. DI MARCO AND E. ZANETTI

Protective effects of MESNA (2-mercaptoethane sulfonate) against acetaminophen-induced hepatorenal oxidative damage in mice 20
G. ŞENER, Ö. SEHIRLI, Ş. CETINEL, B. YEĞEN, N. GEDIK AND G. AYANOĞLU-DÜLGER

Characterization of the binding of cholera toxin to ganglioside G_{M1} immobilized onto microtitre plates 30
R. M. DAWSON

Role of molecular geometry, valence charge distribution and vibrational modes in bioactivity of cyclodiene insecticides 39
P. N. SAXENA AND V. D. GUPTA

Effects of a single intratracheal administration of phenanthraquinone on murine lung 47
K. HIYOSHI, H. TAKANO, K. INOUE, T. ICHINOSE, R. YANAGISAWA, S. TOMURA, A. K. CHO, J. R. FROINES AND Y. KUMAGI

Developmental toxicity assessment of the new fluoroquinolone antibacterial DW-116 in rabbits 52
J.-C. KIM, S. H. KIM, D. H. SHIN, C. S. BAE, K. S. OH, J. H. KIM, H. I. YUN AND M. K. CHUNG

Weak inhibitors protect cholinesterases from strong inhibitors (paraoxon): *in vitro* effect of rantidine 60
G. PETROIANU, K. ARAFAT, A. SCHMITT AND M. Y. HASAN

Protective agents in acute high-dose organophosphate exposure: comparison of rantidine with pralidoxime in rats 68
G. PETROIANU, M. Y. HASAN, S. M. NURULAIN, K. ARAFAT, M. SHAFIULLAH AND O. NESEER

Benzene increases the ratio of arachidonic acids to docosahexaenoic acids and inhibits the *de novo* synthesis of ceramide in the rat liver 74
D. SUL, I. SHIM, H. IM, N.-H. WON, H.-J. KIM AND E. LEE

***In vitro* exposure to quercetin and genistein alters lipid peroxides and prevents the loss of glutathione in human progenitor mononuclear (U937) cells** 82
W. Y. BOADI, P. A. IYERE AND S. E. ADUNYAH

NUMBER 2 MARCH/APRIL 2005

Research Articles

Regulation of manganese accumulation in perinatally exposed rat pups 89
K. KOSTIAL, M. BLANUŠA AND M. PIASEK

Etoposide-induced cytogenotoxicity in mouse spermatogonia and its potential transmission 94
A. K. PALO, P. SAHU AND R. C. CHOUDHURY

Comparison of different test models for the assessment of cytotoxicity of composite resins 101
T. CAO, T. Y. SAW, B. C. HENG, H. LIU, A. U. J. YAP AND M. L. NG

Lead-induced changes in human erythrocytes and lymphocytes 109
E. I. SLOBOZHANINA, N. M. KOZLOVA, L. M. LUKYANENKO, O. B. OLEKSIUK, R. GABBIANELLI, D. FEDELI, G. C. CAULINI AND G. FALCIONI

The effect of sulphur mustard on human skin cell lines with differential agent sensitivity 115
R. SIMPSON AND C. D. LINDSAY

Novel approach for classifying chemicals according to skin sensitizing potency by non-radioisotopic modification of the local lymph node assay 129
M. TAKEYOSHI, K. IIDA, K. SHIRAISHI AND S. HOSHUYAMA

Benefits of combining the sexes when evaluating data from toxicological studies 135
S. J. WIKLUND, K. SVENS, M. PALM AND T. HOLLAND

Legal issues of addiction assessment: the experience with hair testing in Greece 143
M. A. SAVVOPOULOS, E. PALLIS, M. N. TZATZARAKIS, I. A. DIALYNA, G. N. TZANAKAKIS AND A. M. TSATSAKIS

Effect of β-naphthoflavone and phenobarbital on the nephrotoxicity of chlorotrifluoroethylene and 1,1-dichloro-2,2-difluoroethylene in the rat 153
G. MOREL, M. BAN, P. BONNET, D. ZISSU AND M.-T. BRONDEAU

Pro-inflammatory effects of Dunkerque city air pollution particulate matter 2.5 in human epithelial lung cells (L132) in culture 166
Z. DAGHER, G. GARÇON, P. GOSSET, F. LEDOUX, G. SURPATEANU, D. COURCOT, A. ABOUKAIS, E. PUSKARIC AND P. SHIRALI

Changes in serum α_{2U}-globulin levels in castrated male rats treated with testosterone propionate in a Hershberger assay 176
M. TAKEYOSHI, H. MITOMA AND K. YAMASAKI

NUMBER 3 MAY/JUNE 2005

Research Articles

Human relevance of rodent prolactin-induced non-genotoxic mammary carcinogenesis: prolactin involvement in human breast cancer and significance for toxicology risk assessments 179
P. W. HARVEY

Investigation into possible DNA damaging effects of ultrasound in occupationally exposed medical personnel – the alkaline comet assay study 184
V. GARAJ-VRHOVAC AND N. KOPJAR

Effects of an ethanol–gasoline mixture: results of a 4-week inhalation study in rats 193
I. CHU, R. POON, V. VALLI, A. YAGMINAS, W. J. BOWERS, R. SEEGAL AND R. VINCENT

Analysis of opiates, cocaine and metabolites in urine by high-performance liquid chromatography with diode array detection (HPLC-DAD) 200
P. FERNÁNDEZ, C. VÁZQUEZ, L. MORALES AND A. M. BERMEJO

Hair analysis by GC/MS/MS to verify abuse of drugs 205
C. GAMBELUNGHE, R. ROSSI, C. FERRANTI, R. ROSSI AND M. BACCI

Developmental toxicity study with 3-(methylthio)propionaldehyde vapor by whole-body exposure of Sprague-Dawley rats 212
B. BALLANTYNE AND R. E. SCHROEDER

Antioxidant property of *Nigella sativa* (black cumin) and *Syzygium aromaticum* (clove) in rats during aflatoxicosis 218
M. A. ABDEL-WAHHAB AND S. E. ALY

Effect of anaesthetics/terminal procedures on neurotransmitters from non-dosed and aroclor 1254-dosed rats 224
J. S. NAKAI, J. ELWIN, I. CHU AND L. MARRO

Effects of bismuth citrate on the viability and function of Leydig cells and testicular macrophages 234
J. C. HUTSON

The effect of Th2 cytokine antagonist treatments on chemical-induced allergic response in mice 239
M. BAN AND D. HETTICH

Toxicology updates

Toxicology update: 2-ethyl-1,3-hexanediol 248
B. BALLANTYNE

Toxicology update – Bis[2-(dimethylamino)ethyl]ether $(CH_3)_2NCH_2CH_2OCH_2CH_2N(CH_3)_2$ 260
B. BALLANTYNE

NUMBER 4 JULY/AUGUST 2005

Research Articles

Comparison of *in vitro* potency of oximes (pralidoxime, obidoxime, HI-6) to reactivate sarin-inhibited acetylcholinesterase in various parts of pig brain 271
K. KUCA, J. CABAL, J. KASSA, D. JUN AND M. HRABINOVÁ

Comparison of the specificity and sensitivity of traditional methods for assessment of nephrotoxicity in the rat with metabonomic and proteomic methodologies 277
A. GIBBS

***In vitro* reactivation potency of some acetylcholinesterase reactivators against sarin- and cyclosarin-induced inhibitions** 296
K. KUCA, J. CABAL, D. JUN, J. KASSA, L. BARTOSOVÁ AND G. KUNESOVÁ

Oestrogenic activity of *p*-hydroxybenzoic acid (common metabolite of paraben esters) and methylparaben in human breast cancer cell lines 301
D. PUGAZHENDHI, G. S. POPE AND P. D. DARBRE

Reduced mitochondrial membrane potential and metabolism correspond to acute chloroform toxicity of *in vitro* hepatocytes 310
S. HARTIG, S. FRIES AND R. R. BALCARCEL

Acute and subacute dermal toxicity of Break-Free CLP®: a weapons cleaning and maintenance compound 318
D. P. ARFSTEN, E. W. JOHNSON, A. R. THITOFF, A. E. JUNG, K. R. STILL, W. W. BRINKLEY, D. J. SCHAEFFER, W. W. JEDERBERG AND A. J. BOBB

The nitrogen mustard melphalan activates mitogen-activated phosphorylated kinases (MAPK), nuclear factor-κB and inflammatory response in lung epithelial cells 328
C. ÖSTERLUND, B. LILLIEHÖÖK, B. EKSTRAND-HAMMARSTRÖM, T. SANDSTRÖM AND A. BUCHT

NUMBER 5 SEPTEMBER/OCTOBER 2005

Research Articles

The contribution of hepatic steroid metabolism to serum estradiol concentrations in nonylphenol treated MMTVneu mice and its potential effects on breast cancer incidence and latency 339
W. S. BALDWIN, R. ACEVEDO, P. G. PARNELL, H. VILLANUEVA, L. M. CHAPMAN, T. GIMENEZ AND S. L. GRAY

Methotrexate induction of human sulfotransferases in Hep G2 and Caco-2 cells 354
X. CHEN, S. M. BAKER AND G. CHEN

Expression of brush border enzymes in response to lead exposure in rat intestine 361
P. KAPUR, K. KAUR AND A. MAHMOOD

Cytotoxic actions of palytoxin on aortic smooth muscle cells in culture 365
R. E. SHERIDAN, S. S. DESHPANDE AND M. ADLER

Role of ERK activation in cisplatin-induced apoptosis in OK renal epithelial cells 374
Y. K. KIM, H. J. KIM, C. H. KWON, J. H. KIM, J. S. WOO, J. S. JUNG AND J. M. KIM

Influence of bismuth on the number of neurons in cerebellum and hippocampus of normal and hypoxia-exposed mouse brain: A stereological study 383
A. LARSEN, M. STOLTENBERG, M. J. WEST AND G. DANSCHER

GB toxicity reassessed using newer techniques for estimation of human toxicity from animal toxicity data: New method for estimating acute human toxicity (GB) 393
R. W. BIDE, S. J. ARMOUR AND E. YEE

Immediate post-dosing paralysis following severe Soman and VX toxicosis in guinea pigs 410
R. W. BIDE, L. SCHOFIELD AND D. J. RISK

Developmental toxicity study with triethylene glycol given by gavage to CD rats and CD-1 mice 418
B. BALLANTYNE AND W. M. SNELLINGS

Up-and-down procedure (UDP) determinations of acute oral toxicity of nitroso degradation products of hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) 427
S. A. MEYER, A. J. MARCHAND, J. L. HIGHT, G. H. ROBERTS, L. B. ESCALON, L. S. INOUYE AND D. K. MACMILLAN

A new threshold dose-response model including random effects for data from developmental toxicity studies 435
D. L. HUNT AND S. N. RAI

Short Communication

Protective effect of vitamin B6 in chromium-induced oxidative stress in liver 440
S. S. ANAND

Book Review

Detection technologies for chemical warfare agents and toxic vapors 444
C. W. WINDER

NUMBER 6 NOVEMBER/DECEMBER 2005

Research Articles

Clinical and pathological effects of short-term cyanide repeated dosing to goats 445
B. SOTO-BLANCO, B. L. STEGELMEIER AND S. L. GÓRNIAK

Popliteal lymph node assay: facts and perspectives 451
G. RAVEL AND J. DESCOTES

Histopathological effects in tissues of snail *Lymnaea stagnalis* (Gastropoda, Pulmonata) exposed to sublethal concentration of Thiodan® and recovery after exposure 459
E. ÜNLÜ, E. I. CENGIZ, M. Z. YILDIRIM, B. OTLUDIL AND Ö. ÜNVER

Histopathological effects of Thiodan® on the freshwater snail, *Galba truncatula* (Gastropoda, Pulmonata) 464
E. I. CENGIZ, M. Z. YILDIRIM, B. OTLUDIL AND E. ÜNLÜ

Serum levels of albumin, triglycerides, total protein and glucose in rats are altered after oral treatment with low doses of 13-*cis*-retinoic acid or all-*trans*-retinoic acid 470
F. J. CISNEROS, B. J. GOUGH, R. E. PATTON AND S. A. FERGUSON

Effect of binge cocaine treatment on hindlimb vascular function 479
L. PRADHAN, P. DABISCH, J. T. LILES, S. N. MURTHY, S. R. BABER, S. A. SIMPSON, K. C. AGRAWAL AND P. J. KADOWITZ

Effective bisquaternary reactivators of tabun-inhibited AChE 491
K. KUCA, J. CABAL, K. MUSILEK, D. JUN AND J. BAJGAR

The occupational toxicologist: professionalism, morality, and ethical standards in the context of legal and non-litigation issues 496
B. BALLANTYNE

A review of evidence from short-term studies leading to the prediction that diazoaminobenzene (1,3-diphenyltriazine) is a carcinogen 514
N. R. BORDELON, R. CHHABRA AND J. R. BUCHER

Inhibition of mitochondrial respiration by nitric oxide is independent of membrane fluidity modulation or oxidation of sulfhydryl groups 522
J. M. PÉREZ-ROJAS AND P. MURIEL

Potential developmental toxicity of anatoxin-a, a cyanobacterial toxin 527
E. H. ROGERS, E. S. HUNTER III, V. C. MOSER, P. M. PHILLIPS, J. HERKOVITS, L. MUÑOZ, L. L. HALL AND N. CHERNOFF

Pro-oxidative vs antioxidative properties of ascorbic acid in chromium(VI)-induced damage: an *in vivo* and *in vitro* approach 535
B. POLJŠAK, Z. GAZDAG, Š. JENKO-BRINOVEC, Š. FUJS, M. PESTI, J. BÉLAGYI, S. PLESNIČAR AND P. RASPOR

Effect of selected alcohol dehydrogenase inhibitors on human hepatic lactate dehydrogenase activity – an *in vitro* study 549
J. DUDKA, F. BURDAN, J. SZUMILO, E. TOKARSKA, A. KOROBOWICZ, R. KLEPACZ, R. GIEROBA, B. MADEJ AND E. KOROBOWICZ

Intraperitoneal injection of D-galactosamine provides a potent cell proliferation stimulus for the detection of initiation activities of chemicals in rat liver 554
Y. ASAOKA, H. SAKAI, N. TAKAHASHI, A. HIRATA, T. TSUKAMOTO, M. YAMAMOTO, T. YANAI, T. MASEGI AND M. TATEMATSU

Weak inhibitors protect cholinesterases from strong inhibitors (paraoxon): *in vitro* effect of tiapride 562
G. A. PETROIANU, M. Y. HASAN, K. ARAFAT, S. M. NURULAIN AND A. SCHMITT

Effect of metoclopramide and ranitidine on the inhibition of human AChE by VX *in vitro* 568
A. BARTLING, H. THIERMANN, L. SZINICZ AND F. WOREK

Book Reviews

Endocrine Disruptors: Effects on Male and Female Reproductive Systems 572
P. W. HARVEY

Developmental Immunotoxicology 574
P. W. HARVEY